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Masatake Tamaru

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POSZ LAW GROUP, PLC  
12040 SOUTH LAKES DR.  
SUITE 101  
RESTON, VA 20191

EXAMINER

CHOI, PETER H

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PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b>		<b>Applicant(s)</b>	
	09/973,757		TAMARU, MASATAKE	
	<b>Examiner</b> Peter Choi		<b>Art Unit</b> 3623	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

#### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) ☒ Responsive to communication(s) filed on 2/12/07.
- 2a) ☒ This action is **FINAL**.                      2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) ☒ Claim(s) 33-64 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 33-64 is/are rejected.
- 7) ☒ Claim(s) 45 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

- |                                                                                                            |                                                                                         |
|------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)                                | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                       | 5) <input type="checkbox"/> Notice of Informal Patent Application                       |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____                                                |

### **DETAILED ACTION**

1. The following is a **FINAL** office action upon examination of application number 09/973,757. Claims 1-32 have been canceled and replaced by new claims 33-64 in the amendment filed February 12, 2007. Claims 33-64 are pending in the application and have been examined on the merits discussed below.

### ***Response to Arguments***

2. Applicant's arguments with respect to claims 33-64 have been considered but are moot in view of the new ground(s) of rejection.

### ***Official Notice***

Applicant has attempted to challenge the Examiner's taking of Official Notice in the Office Action mailed December 20, 2005. There are minimum requirements for a challenge to Official Notice:

(a) In general, a challenge, to be proper, must contain adequate information or arguments so that *on its face* it creates a reasonable doubt regarding the circumstances justifying the Official Notice

(b) Applicants must seasonably traverse (challenge) the taking of Official Notice as soon as practicable, meaning the next response following an Office Action. If an applicant fails to seasonably traverse the Official Notice during examination, his right to challenge the Official Notice is waived.

Applicant has not provided adequate information or arguments so that *on its face* it creates a reasonable doubt regarding the circumstances justifying the Official Notice. Therefore, the presentation of a reference to substantiate the Official Notice is not deemed necessary. The Examiner's taking of Official Notice has been maintained.

Bald statements such as, "the Examiner has not provided proof that this element is well known" or "applicant disagrees with the Examiner's taking of Official Notice and hereby requests evidence in support thereof", are not adequate and do not shift the burden to the Examiner to provide evidence in support of the Official Notice.

In the previous Office Action mailed December 20, 2005, notice was taken by the Examiner that certain subject matter is old and well known in the art. Per MPEP 2144.03(c), these statements are taken as admitted prior art because no traversal of this statement was made in the subsequent response. Specifically, it has been taken as prior art that:

- It is old and well known in the arts to notify relevant parties of the status and availability (or unavailability) of work machines at a site
- Connecting data terminals to an electronic communications network, such as the internet, is a step that is old and well known in the art

In the previous Office Action mailed September 12, 2006, notice was taken by the Examiner that certain subject matter is old and well known in the art. Per MPEP 2144.03(c), these statements are taken as admitted prior art because no traversal of

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this statement was made in the subsequent response. Specifically, it has been taken as prior art that:

- Displaying information is old and well known in the art
- It is old and well known in the art for work plans to comprise a plurality of tasks
- It is old and well known in the art to assign resources to scheduled tasks
- It is old and well known in the art to collect data regarding environmental conditions
- Local, federal and international ordinances, regulations, and laws govern acceptable noise levels and toxic chemical concentration limits for areas in which work is performed

### ***Claim Objections***

3. Claim 45 is objected to because of the following informalities: Claim 45 is dependent on claim 6, which has been canceled in the amendment received February 12, 2007. The Examiner has assumed, based on the cross-reference between the new claims and old claims (supplied by Applicant as Appendix A), that claim 45 is dependent on claim 38.. Appropriate correction is required.

### ***Claim Rejections - 35 USC § 103***

4. Claims 33-64 are rejected under 35 U.S.C. 103(a) as being unpatentable over Melby et al. (U.S Patent 6,952,680) in view of Gudat et al. (US Patent #5,646,844).

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As per claim 33, Melby et al. teaches a work machine management system for work machines that perform prescribed work by operation of a plurality of work machines, comprising:

(a) a plurality of work machines (**assets 11 – a plurality of pieces of movable industrial equipment; forklifts 31**), said plurality of work machines respectively including a first communication means (**each of the forklifts 31 is further provided with a transmitter 33 or other communications system for transmitting the acquired data from the data acquisition device 32 to the remote analysis system 50 for analysis**) facilitating reciprocal communications (**transmitter 33 is preferably embodied as a wireless communications system, such as represented by an antenna 34; the transmitters 33 and the wireless communications systems 34 can be embodied as conventional radio frequency transmitters provided on each of the forklifts 31 that transmit electromagnetic signals; wireless communications systems 34 are adapted to transmit signals that are representative of the sense operating conditions of the forklifts 31 through space to a receiver 35; the data acquisition units 32 and the receivers 35 are in bi-directional communication with one another**) [Column 3, lines 55-57, Column 7, lines 5-8, 14-27, 38-39];

(b) a server apparatus (**remote analysis system 50**), wherein at least one leader machine of said plurality of work machines (**local controller 36 that is adapted to receive and store data from each of the receivers 35 and to periodically transmit gathered and stored information regarding the individual operating**

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**characteristics to the remote analysis system 50 for analysis)** and said server apparatus including second communication means **(modem 52 or similar communications device; conventional modem 37 or other communications device; electronic communications network, such as the internet 40)** facilitating reciprocal communications between said server apparatus and said at least one leader work machine of said plurality of work machines [Column 7, lines 62-67, Column 8, lines 23-30, 48-52];

(c) each of said plurality of work machines being provided with work machine information detection means **(data acquisition device 32 is provided on each of the forklifts 31 for sensing and storing one or more characteristics of the associated forklift)** for detecting work machine information **(operational characteristics of the particular asset 11 being tracked, such as the physical requirements or limitations of the asset (mast height, load capacity, types of tires, for example), the type of fuel used, and the period of time or usage between the performance of periodic maintenance; time duration of use (and non-use), distances traveled, the extent of fork usage, the nature of hydraulic system utilization, and the like)** [Column 4, lines 34-44, Column 6, lines 48-50, 52-63];

(d) a database **(analysis controller database 78)** storing data for managing said plurality of work machines **(real-time and historical information; maintenance information performed {step 82})**, and management information production means producing management information **(determine that further preventative maintenance is required)** based on said work machine information and on said data

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stored in said database, provided at said server apparatus [Column 12, lines 18-19, 56-57];

(e) in conjunction with work progress of said plurality of work machines, said work machine information being detected by said work machine information detection means provided in said plurality of work machines, and the work machine information so detected being transmitted to said at least one leader work machine **(each of the forklifts 31 is further provided with a transmitter 33 or other communications system for transmitting the acquired data from the data acquisition device 32 to the remote analysis system 50 for analysis)** through said first communication means [Column 7, lines 5-8, 14-27, 38-39];

(f) said at least one main work machine transmitting said transmitted work machine information to said server apparatus **(remote analysis system 50)** through said second communication means **(each of the forklifts 31 is further provided with a transmitter 33 or other communications system for transmitting the acquired data from the data acquisition device 32 to the remote analysis system 50 for analysis)** [Column 7, lines 5-8, 14-27, 38-39];

(g) said server apparatus **(remote analysis system 50)** producing said management information **(automatically generate maintenance and warranty reports in response to received information regarding assets 31; automatically generate and analyze management reports relating to the procurement and utilization of a plurality of the forklifts 31)** based on said transmitted work machine information and on said data stored in said database **(real-time and historical**



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**information; determine that further preventative maintenance is required), and transmitting the management information so produced to said at least one main work machine through said second communication means (all of the reports generated are automatically delivered through the Internet 40)** [Column 6, lines 60-63, Column 15, lines 30-41]; and

(h) said at least one main work machine transmitting work instructions to other work machines of said plurality of work machines **(management report can advise the person or entity that owns or operates the asset 31; carrying out said work order to maintain the asset)** through said first communication means **{As seen in Figure 3, reports would be transmitted via Internet 40 and model 37 to local controller 36 and receiver 35, which is further connected to forklifts 31 (i.e., work machine) via wireless communications system 34 (i.e., first communication means); forklifts 31 are connected to a plurality of other forklifts via the wireless communications system 34 and receiver 35; thus, reports are transmitted between work machines via the wireless communications system 34}**, based on said transmitted management information [Column 11, lines 42-44; Claim 9].

Melby et al. does not explicitly teach the step of direct reciprocal communication between a plurality of work machines.

However, Gudat et al. teaches a method for real-time monitoring and coordination of multiple geography altering machines on a work site, where each

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machine is further equipped to transmit its position signals to the other machine, and to receive the other machine position signals [Column 3, lines 62-64].

Both Melby et al. and Gudat et al. are directed towards tracking and managing work machines at a site. Therefore, it would have been obvious to one of ordinary skill in the art at the time of invention to modify the teachings of Melby et al. to include the step of including direct reciprocal communications between a plurality of work machines, because doing so streamlines the communication process by allowing real-time monitoring and coordination, which is a goal of Gudat et al. [abstract].

Neither Melby et al. nor Gudat et al. explicitly teaches the step of transmitting information only to a leader work machine.

However, Official Notice is taken that it is old and well known in the art to distribute information only to leaders, who, in turn propagate said distributed information to subordinates as necessary. Thus, the Examiner asserts that it would have been obvious to one of ordinary skill in the art at the time of invention to modify the Melby-Gudat combination to include the step of transmitting information only to a leader work machine, because doing so would avoid, reduce, or eliminate undesirable overlap between machine operations, further enhancing the ability of Melby et al. to track and manage physical assets such as work machines.

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As per claim 34, neither Melby et al. nor Gudat et al. explicitly teaches the work machine management system according to claim 33, wherein said at least one leader work machine includes a display device, and wherein said management information transmitted from said server apparatus to said at least one leader work machine is displayed on the display device.

However, it has been admitted as prior art, as a result of improperly and/or untimely challenged Official Notice, that displaying information is old and well known in the art. Melby et al. provides for work order 166 to be transmitted electronically to a handheld device 168 associated with specific maintenance personnel assigned to carry out the maintenance [Column 17, lines 21-30]. Melby teaches the generation of an electronic management report, which is delivered through the Internet 40. Melby discloses that the management report can advise the person or entity that owns or operates the asset. Melby also cites the benefit of analyzing relevant information to anticipate problems before they affect asset utilization [Column 12, lines 8-15]. Thus, the Examiner asserts that the management report contains written instructions or data that require some sort of display mechanism to be viewed and subsequently executed to avoid anticipated problems that would affect asset utilization; thus, it would have been obvious to one of ordinary skill in the art to modify the Melby-Gudat combination to display management information transmitted from a server apparatus, because doing so would enable the owner or operator of said asset to proactively take measures to avoid

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problems that affect asset utilization, thereby increasing the availability of work machines required to perform scheduled work.

As per claim 35, neither Melby et al. nor Gudat et al. explicitly teaches the work machine management system according to claim 33, wherein said prescribed work comprises a plurality of work processes; and said at least one leader work machine is determined for each of those work processes.

However, it has been admitted as prior art, as a result of improperly and/or untimely challenged Official Notice, that it is old and well known in the art for work plans to comprise a plurality of tasks. It has also been admitted as prior art, as a result of improperly and/or untimely challenged Official Notice, that it is old and well known in the art to assign resources to scheduled tasks. Melby et al. is directed towards actively managing the operation of assets (machines); thus assigning resources to each of the scheduled tasks comprising a work plan would enable a user to ensure that adequate resources are available to perform all the scheduled work comprising a work plan. Therefore, it would have been obvious to one of ordinary skill in the art at the time of invention to modify the Melby-Gudat combination to assign work machines to each of a plurality of work processes comprising a scheduled work plan, because doing so would allow the Melby-Gudat combination to effectively manage and allocate resources to meet the demand necessitated by work orders. Maximizing productivity and reducing

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operating costs and administrative burdens is a goal of Melby et al. [Column 2, lines 45-46].

As per claim 36, Melby et al. teaches the work machine management system according to claim 33, wherein said management information produced by said server apparatus and transmitted to said at least one leader work machine is information relating to maintenance that should be performed on any of said plurality of work machines **(Once it is determined that maintenance of some type is required based on an analysis of the operational status of asset 31, a maintenance report is generated and made available electronically by the Internet)** [Column 16, lines 26-30].

As per claim 37, Melby et al. teaches the work machine management system according to claim 33, wherein said management information produced by said server apparatus and transmitted to said at least one main work machine is information relating to a trouble that has occurred in any of said plurality of work machines **(fault code may be generated based on the actions of the asset operator)** [Column 16, lines 6-7].

As per claim 38, Melby et al. teaches a work machine management system for work machines that perform prescribed work by operation of a plurality of work machines in accordance with a scheduled work plan, comprising:

(a) a plurality of work machines, said plurality of work machines respectively including a first communication means facilitating reciprocal communications directly between said plurality of work machines [**see discussion of claim 33(a) above**];

(b) a server apparatus, wherein only at least one leader work machine only of said plurality of work machines and said server apparatus including a second communication means facilitating reciprocal communications between said server apparatus and said at least one leader work machine of said plurality of work machines [**see discussion of claim 33(b) above**];

(c) each of said plurality of work machines being provided with work machine information detection means for detecting work machine information [**see discussion of claim 33(c) above**];

(d) a database (**analysis controller database 78**) storing data for managing said plurality of work machines (**real-time and historical information; maintenance information performed {step 82}**), and scheduled work plan production means for producing a scheduled work plan (**work order 166 is generated based on approved preventative maintenance**) based on said work machine information data and on said data stored in said database, provided at said server apparatus [Column 12, lines 18-19, 56-57, Column 17, lines 1-6];

(e) in conjunction with work progress of said plurality of work machines, said work machine information being detected by said work machine information detection means provided in said plurality of work machines, and the work machine information so

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detected being transmitted to said at least one main work machine or machines through said first communication means [**see discussion of claim 33(e) above**];

(f) said at least one leader work machine transmitting said transmitted work machine information to said server apparatus through said second communication means [**see discussion of claim 33(f) above**];

(g) said server apparatus produces a scheduled work plan (**work order 166**), based on said transmitted work machine information and on said data stored in said database (**work order 166 is generated based on approved preventative maintenance**), and transmitting that scheduled work plan so produced to said at least one leader work machine through said second communication means (**work order 166 is sent electronically to appropriate maintenance personnel that contains all of the critical operating data required to effectively schedule and carry out the maintenance**) [Column 17 lines 1-9]; and

(h) only said at least one leader work machine transmitting said work instructions to other work machines of said plurality of work machines through said first communication means, based on said transmitted scheduled work plan [**see discussion of claim 33(h) above**].

As per claim 39, neither Melby et al. nor Gudat et al. explicitly teaches the work machine management system according to claim 38, wherein said at least one leader work machine includes a display device, and wherein said scheduled work plan

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transmitted from said server apparatus to said at least one leader work machine is displayed on the display device.

However, it has been admitted as prior art, as a result of improperly and/or untimely challenged Official Notice, that displaying information is old and well known in the art. Melby et al. provides for work order 166 to be transmitted electronically to a handheld device 168 associated with specific maintenance personnel assigned to carry out the maintenance [Column 17, lines 21-30]. Melby teaches the generation of an electronic management report, which is delivered through the Internet 40. Melby discloses that the management report can advise the person or entity that owns or operates the asset. Melby also cites the benefit of analyzing relevant information to anticipate problems before they affect asset utilization [Column 12, lines 8-15]. Thus, the Examiner asserts that the management report contains written instructions or data that require some sort of display mechanism to be viewed and subsequently executed to avoid anticipated problems that would affect asset utilization; thus, it would have been obvious to one of ordinary skill in the art to modify the Melby-Gudat combination to display management information transmitted from a server apparatus, because doing so would enable the owner or operator of said asset to proactively take measures to avoid problems that affect asset utilization, thereby increasing the availability of work machines required to perform work. Maximizing productivity and reducing operating costs and administrative burdens is a goal of Melby et al. [Column 8, lines 60-65].



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As per claim 40, neither Melby et al. nor Gudat et al. explicitly teaches the work machine management system according to claim 38, wherein said scheduled work plan comprises a plurality of work processes; and said at least one main work machine is determined for each of those work processes.

However, it has been admitted as prior art, as a result of improperly and/or untimely challenged Official Notice, that it is old and well known in the art for work plans to comprise a plurality of tasks. It has also been admitted as prior art, as a result of improperly and/or untimely challenged Official Notice, that it is old and well known in the art to assign resources to scheduled tasks. Melby et al. is directed towards actively managing the operation of assets (machines); thus assigning resources to each of the scheduled tasks comprising a work plan would enable a user to ensure that adequate resources are available to perform all the scheduled work comprising a work plan. Therefore, it would have been obvious to one of ordinary skill in the art at the time of invention to modify the Melby-Gudat combination to assign work machines to each of a plurality of work processes comprising a scheduled work plan, because doing so would allow Melby et al. to effectively manage and allocate resources to meet the demand necessitated by work orders. Maximizing productivity and reducing operating costs and administrative burdens is a goal of Melby et al. [Column 2, lines 45-46].

As per claim 41, Melby et al. teaches the work machine management system according to claim 38, wherein said server apparatus transmits information relating to

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maintenance that should be done to any of said plurality of work machines (**Once it is determined that maintenance of some type is required based on an analysis of the operational status of asset 31, a maintenance report is generated and made available electronically by the Internet**) [Column 16, lines 26-30], and said server apparatus transmits a revised scheduled work plan produced by revising the scheduled work plan in conjunction with the performance of maintenance (**work order 166 is sent electronically to appropriate maintenance personnel that contains all of the critical operating data required to effectively schedule and carry out the maintenance**), to said at least one leader work machine [Column 17, lines 5-9].

As per claim 42, Melby et al. teaches the work machine management system according to claim 38, further comprising:

(a) a terminal apparatus (**handheld device 168**) provided on an end where maintenance is done on said plurality of work machines, said terminal apparatus being connected to said second communication means (**handheld device 168 is in real-time two way communication with analysis controller database 78**) [Column 17, lines 25-27];

(b) wherein said server apparatus transmits information relating to maintenance that should be done to any of said plurality of work machines, and transmits a revised scheduled work plan produced by revising the scheduled work plan in conjunction with the performance of maintenance, to said at least one leader work machine (**work order 166 is transmitted electronically to a handheld device 168**

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**associated with specific maintenance personnel assigned to carry out the maintenance)** [Column 17, lines 5-9, 21-27]; and

(c) wherein said at least one leader work machine transmits instructions for performing maintenance, based on the transmitted information relating to maintenance **(information concerning anticipated parts and the nearest location from where they may be retrieved based on information contained within the fault code or retrieved from the knowledgebase)**, to said terminal apparatus through said second communication means, and transmits work instructions to other work machines of said plurality of work machines through said first communication means based on said revised scheduled work plan [Column 17, lines 12-16].

As per claim 43, Melby et al. teaches the work machine management system according to claim 38, wherein said server apparatus transmits information relating to trouble that has arisen in said plurality of work machines **(fault codes)**, and a revised scheduled work plan produced by revising the scheduled work plan responsive to the troubles **(work order 166 is sent electronically to appropriate maintenance personnel that contains all of the critical operating data required to effectively schedule and carry out the maintenance)**, to said main at least one leader work machine [Column 17 lines 5-9].

As per claim 44, Melby et al. teaches the work machine management system according to claim 38, further comprising:

(a) a trouble correction terminal apparatus (**handheld device 168**) provided on the end where trouble with said plurality of work machines is corrected, the trouble correction terminal being connected to said second communication means (**handheld device 168 is in real-time two way communication with analysis controller database 78**) [Column 17, lines 25-27];

(b) wherein said server apparatus transmits information relating to the trouble (**fault code**), and a revised scheduled work plan produced by revising the scheduled work plan responsive to the trouble, to said at least one leader work machine (**work order 166 is transmitted electronically to a handheld device 168 associated with specific maintenance personnel assigned to carry out the maintenance; work order 166 is sent electronically to appropriate maintenance personnel that contains all of the critical operating data required to effectively schedule and carry out the maintenance**) [Column 17, lines 5-9, 21-27]; and

(c) wherein said at least one leader work machine transmits instructions for correcting the trouble, based on the information relating to the trouble (**information concerning anticipated parts and the nearest location from where they may be retrieved based on information contained within the fault code or retrieved from the knowledgebase**), to said trouble correction terminal apparatus through said second communication means, and transmits work instructions to other work machines of said plurality of work machines through said first communication means in accordance with said revised scheduled work plan [Column 17, lines 12-16].

As per claim 45, Melby et al. teaches the work machine management system according to claim 38, wherein said server apparatus stores in memory a schedule and performance results data indicating a relationship between a scheduled work plan previously produced and an actual work performance result as performed in accordance with said scheduled work plan **(determine whether a predetermined period of time has elapsed in order to generate a periodic management report covering some or all of the assets being tracked; real-time and historical information; maintenance information performed {step 82}; determine whether scheduled maintenance has been performed, and determining the party responsible for certain maintenance activities; information regarding maintenance performed is stored in database 78)**, and said server apparatus produces a new scheduled work plan responsive to said schedule and said performance results data [Column 11, lines 64-66, Column 12, lines 18-19, 56-57].

As per claim 46, Melby et al. teaches a scheduled work plan production apparatus that, in cases where a scheduled work plan is produced according to work request data indicating particulars of work requested by an ordering party, and work is caused to be done, using a plurality of work machines, based on said produced scheduled work plan, produces said scheduled work plan, comprising:

(a) a plurality of work machines **(assets 11 – a plurality of pieces of movable industrial equipment; forklifts 32)** [Column 3, lines 55-57], said plurality of work machines respectively including its first communication means facilitating

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reciprocal communications (each of the forklifts 31 is further provided with a transmitter 33 or other communications system for transmitting the acquired data from the data acquisition device 32 to the remote analysis system 50 for analysis) between said plurality of work machines facilitating reciprocal communications (transmitter 33 is preferably embodied as a wireless communications system, such as represented by an antenna 34; the transmitters 33 and the wireless communications systems 34 can be embodied as conventional radio frequency transmitters provided on each of the forklifts 31 that transmit electromagnetic signals; wireless communications systems 34 are adapted to transmit signals that are representative of the sense operating conditions of the forklifts 31 through space to a receiver 35; the data acquisition units 32 and the receivers 35 are in bi-directional communication with one another) [Column 7, lines 5-8, 14-27, 38-39];

(b) a server apparatus (remote analysis system 50) [Column 7, lines 8, Figure 3];

(c) a database (analysis controller database 78) for storing schedule and performance results data indicating a relationship between a scheduled work plan previously produced and an actual work performance result as performed on basis of a scheduled work plan (determine whether a predetermined period of time has elapsed in order to generate a periodic management report covering some or all of the assets being tracked; real-time and historical information; maintenance information performed {step 82}; determine whether scheduled maintenance has

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**been performed, and determining the party responsible for certain maintenance activities) the data base being provided (information regarding maintenance performed is stored in database 78) at said server apparatus (remote analysis system 50 {which is also connected to an electronic communications network})**

[Column 11, lines 64-66, Column 12, lines 18-19, 56-57]

(d) wherein a terminal apparatus (**handheld device 168**) on an end of an ordering party; said server apparatus and only at least one leader work machine of said plurality of work machines, which are connected by a communication means facilitating reciprocal communications (**handheld device 168 is in real-time two way communication with analysis controller database 78**) only among said terminal apparatus of said ordering machine, said server apparatus, and at least one leader work machine of said plurality of work machines [Column 17, lines 25-27];

(e) wherein said work request data are input from said terminal apparatus on said ordering party end through said second communication means (**handheld device 168 is in real-time two way communication with analysis controller database, thus, dealer billing systems, inventory listings, customer work order approval records, fleet management information can be accessed by handheld device 168; handheld device 168 is used to update database 78 including labor information and an identification of any parts required to effect a repair**) [Column 17, lines 24-30, 35-38];

(f) wherein said server apparatus produces a scheduled work plan based on input work request data and on a schedule and performance results data stored in said

database, and said server apparatus transmits said scheduled work plan to said at least one leader work machine only through said second communication means, and updates said schedule and performance results data in said database (**work order 166 is transmitted electronically to a handheld device 168 associated with specific maintenance personnel assigned to carry out the maintenance; work order 166 is sent electronically to appropriate maintenance personnel that contains all of the critical operating data required to effectively schedule and carry out the maintenance; remote analysis system 50 automatically updates individual records associated with each of the assets with information {such as fault codes, maintenance problems, when routine maintenance is required} received from the Internet**) [Column 2, lines 55-57, Column 17, lines 5-9, 21-27];

(g) said at least one leader work machine giving work instructions to said plurality of work machines through said first communication means based on said scheduled work plan (**work order 166**) transmitted from said server apparatus, and said plurality of work machines transmitting actual work performance result as performed on a basis of said scheduled work plan to said server apparatus through said communication means (**carrying out said work order to maintain the asset**) [Claim 9]; and

(f) wherein said server apparatus (**remote analysis system 50**) updates said database (**analysis controller database 78**) with said actual work performance result (**remote analysis system 50 automatically updates individual records associated with each of the assets with information {such as fault codes, maintenance**



**problems, when routine maintenance is required} received from the Internet)**

[Column 2, lines 55-57].

Melby et al. does not explicitly teach the step of direct reciprocal communication between a plurality of work machines.

However, Gudat et al. teaches a method for real-time monitoring and coordination of multiple geography altering machines on a work site, where each machine is further equipped to transmit its position signals to the other machine, and to receive the other machine position signals [Column 3, lines 62-64].

Both Melby et al. and Gudat et al. are directed towards tracking and managing work machines at a site. Therefore, it would have been obvious to one of ordinary skill in the art at the time of invention to modify the teachings of Melby et al. to include the step of including direct reciprocal communications between a plurality of work machines, because doing so streamlines the communication process by allowing real-time monitoring and coordination, which is a goal of Gudat et al. [abstract].

As per claim 47, Melby et al. teaches the scheduled work plan production apparatus according to claim 46, wherein:

(a) when revision data for revising scheduled work plan are provided, said server apparatus revises the scheduled work plan based on those revision data, said

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work request data, and said schedule and said performance results data (**handheld device 168 is used to update database 78, including labor information and an identification of any parts required to effect a repair**), to produce a revised scheduled work plan, and said server apparatus transmits said revised scheduled work plan to said at least one leader machine of said plurality of work machines through said communication means (**handheld device 168 is in real-time two way communication with analysis controller database**) [Column 2, lines 55-57, Column 17, lines 24-27, 35-38]; and

(b) said plurality of work machines performing work based on the revised scheduled work plan (**carrying out said work order to maintain the asset**), and said plurality of work machines transmitting the actual work performance results on a basis of said schedule work plan to said server apparatus by said communication means (**remote analysis system 50 automatically updates individual records associated with each of the assets with information {such as fault codes, maintenance problems, when routine maintenance is required} received from the Internet**) [Column 2, lines 55-57; Claim 9].

As per claim 48, Melby et al. teaches a scheduled work plan production apparatus that, in cases where a scheduled work plan is produced according to work request data indicating particulars of work requested by an ordering party, a plurality of work machines is obtained, and work is caused to be done using said plurality of work

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machines so obtained, based on said produced scheduled work plan, produces said scheduled work plan, comprising:

- (a) a server (**remote analysis system 50**) [Column 7, lines 8 , Figure 3];
- (b) a database for storing a schedule and performance results data indicating a relationship between a scheduled work plan previously produced and actual work performance results as performed on basis of said scheduled work plan at the server apparatus [**see analysis of claim 46(c) above**];
- (c) a plurality of work machines, said plurality of the work machines respectively including a first communication means facilitating reciprocal communications directly between said plurality of work machines [**see analysis of claim 46(a) above**];
- (e) a terminal apparatus on said ordering party end, wherein said terminal apparatus, said server apparatus, only at least one leader work machine of said plurality of work machines, and are connected by a second communication means configured to facilitate reciprocal communications only among said terminal apparatus, said server apparatus, said at least one leader work machine of said plurality of work machines, and said rental/production and terminal apparatus [**see analysis of claim 46(d) above**];
- (f) wherein said work request data are input from said terminal apparatus to said server apparatus through said second communication means [**see analysis of claim 46(e) above**];
- (g) wherein said server apparatus facilitates producing a scheduled work plan responsive to the work request data and to the schedule and the performance results

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data, transmitting said scheduled work plan to said at least one leader work machine and to said rental/production end terminal apparatus through said second communication means, and updating the schedule and the performance results data in said database **[see analysis of claim 46(f) above]**;

(h) said at least one leader work machines giving work instructions to said plurality of work machines through said first communication means based on the scheduled work plan from said server apparatus, and transmitting actual work performance results as performed on basis of said scheduled work plan to said server apparatus by said second communication means **[see analysis of claim 46(g) above]**;

(i) wherein said server apparatus updates said database with the actual work performance results **[see analysis of claim 46(h) above]**.

Melby et al. does not explicitly teach the inclusion of a rental/production end terminal apparatus on a communication means. However, it has been admitted as prior art, as a result of improperly and/or untimely challenged Official Notice, that connecting data terminals to an electronic communications network, such as the Internet, is a step that is old and well known in the art. Furthermore, the step of connecting an additional terminal apparatus to the electronic communications network taught by Melby et al. can be performed in a similar fashion to the ordering party terminal, meeting the limitation of the claim.

Neither Melby et al. nor Gudat et al. explicitly teaches:

(d) a rental/production end terminal apparatus for renting or producing said work machine, said rental/production end terminal apparatus being provided on the ends where rental/production is performed; and

(j) wherein said rental/production end terminal apparatus plans rental or production based on said scheduled work plan from said server apparatus.

However, handheld device 168 of Melby et al. is in real-time two way communication with analysis controller database 78 and is enabled to update said database regarding required and scheduled maintenance. The system is further enabled to automatically order replacement parts. The need to rent or produce additional work machines may be based on information entered by the handheld device. Further, the system can be enabled to automatically order replacement/additional machines, in a fashion similar to ordering replacement parts. Said orders are propagated throughout the analysis system 50. The system provides for automatic generation of reports for required maintenance work, and can be enabled to generate order reports for required additional/replacement work machines. Therefore, handheld device 168 is capable of facilitating such actions, meeting the limitations of the claim.

Furthermore, it would have been obvious to one of ordinary skill in the art at the time of invention to modify the Melby-Gudat combination to include a terminal for renting/producing work machines because the resulting invention would enable the system to obtain additional resources, as needed, to provide an adequate number of

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work machines to perform prescribed work without suffering costly delays (time and financial, as resulting from a decreased number of available work machines, delaying the completion of said prescribed work).

As per claim 49, neither Melby et al. nor Gudat et al. explicitly teaches the work machine management system according to claim 33, further comprising:

(a) an information display for displaying information outside of a work site where said plurality of work machines are operating is provided in one or more of said plurality of work machines;

(b) wherein said server apparatus produces information relating to said work site, based on the work machine information, and on the data stored in said database, and transmits said information relating to said work site to said leader work machine through said second communication means; and

(c) said at least one leader work machine displays said information relating to said work site on said information display.

However, it has been admitted as prior art, as a result of improperly/untimely challenged Official notice that it is old and well known in the arts to notify relevant parties of the status and availability (or unavailability) of work machines at a site. Melby et al. collects a plurality of data on the usage of work machines to determine whether the responsibility for the maintenance being performed on the asset should rest with the manufacturer, supplier, owner or user of the asset [Column 9, lines 38-44] and also to

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analyze a knowledgebase of relevant information to analyze appropriate trends [Column 12, lines 9-21], such as those pertaining to the need for preventative maintenance.

Therefore, it would have been obvious to one of ordinary skill in the art at the time of invention to modify the Melby-Gudat combination to include an information display at a work site so that appropriate personnel can be notified of a need to procure replacement work machines, obtain a work order, or to reconfigure a work schedule to compensate for the status of a work machine on which a main work machine is dependent on to perform work.

As per claim 50, Melby et al. teaches the work machine management system according to claim 49, wherein:

(a) said information display is deployed on a work machine other than said one leader work machine (**handheld device 168**); and

(b) said at least one leader work machine transmits transmitted information relating to said work site to another work machine through said first communication means (**each of the forklifts 31 is further provided with a transmitter 33 or other communications system for transmitting the acquired data from the data acquisition device 32 to the remote analysis system 50 for analysis**) and causes said information to be displayed on said information display deployed on said other work machine (**handheld device 168 is in real-time two way communication with analysis controller database, thus, dealer billing systems, inventory listings, customer work order approval records, fleet management information can be**

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**accessed by handheld device 168; handheld device 168 is used to update database 78 including labor information and an identification of any parts required to effect a repair)** [Column 7, lines 5-8, 14-27, 38-39].

As per claim 51, Melby et al. teaches the work machine management system according to claim 33, further comprising:

(a) an information display for displaying information outside of a work site where said plurality of work machines are operating, installed in the periphery of said work site **(receiver 35 that is provided at a fixed location within the environment in which they are operated; receiver 35 may be provided on movable structures that move about the environment to receive the information transmitted thereon)** [Column 7, lines 24-37];

(b) wherein said server apparatus produces information relating to said work site, based on said work machine information and on the data stored in said database, and transmits said information relating to said work site to said one leader work machine through said second communications means **[see analysis of claim 33(g) above]**;

(c) wherein said at least one leader work machine **(local controller 36)** displays said information relating to said work site on said information display **(receiver 35 confirms the accuracy and completeness of information transmitted by data acquisition unit 32; local controller 36 is connected to receiver 35)** [Column 7, lines 38-53 and 62].



As per claim 52, Melby et al. teaches the work machine management system according to claim 51, wherein said one leader work machine causes the information relating to said work site to be displayed on said information display installed in the periphery of said work site via said first communication means **(wireless communications system 34 is adapted to transmit signals that are representative of the sensed operating conditions of the forklifts 31 to a receiver 35 that is provided at a fixed location within the environment in which they are operated)** [Column 7, lines 24-37].

As per claim 53, Melby et al. teaches the work machine management system according to claim 33, further comprising:

(a) an information display for providing information outside of a work site where said plurality of work machines are operating, installed in the periphery of said work site **(wireless communications system 34 is adapted to transmit signals that are representative of the sensed operating conditions of the forklifts 31 to a receiver 35 that is provided at a fixed location within the environment in which they are operated)** [Column 7, lines 24-37]; and

(b) wherein said server apparatus **(remote analysis system 50)** produces information relating to said work site, **(automatically generate maintenance and warranty reports in response to received information regarding assets 31; automatically generate and analyze management reports relating to the**

**procurement and utilization of a plurality of the forklifts 31)** based on work machine information that has been transmitted and on said data stored in said database **(real-time and historical information; determine that further preventative maintenance is required)**, transmits said information relating to said work site to said information display through said second communication means, and causes said information relating to said work site to be displayed on said information display **(receiver 35 that is provided at a fixed location within the environment in which they are operated; receiver 35 may be provided on movable structures that move about the environment to receive the information transmitted thereon)** [Column 7, lines 24-37].

As per claim 54, Melby et al. teaches a work machine management system of work machines according to claim 33, further comprising:

(a) environmental condition measurement means **(data acquisition device 32)** for measuring environmental conditions **(any desired operating conditions of the forklift 31 that might be considered important in making effective management decisions regarding the operation of the forklift 31; distances traveled)** in a periphery of a work site, provided in the periphery of said work site [Column 6, lines 48-63];

(b) at least one an information display for displaying information outside of a work site, being arranged in at least one of the periphery of said work site, and said at least one leader machine **(wireless communications system 34 is adapted to**

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**transmit signals that are representative of the sensed operating conditions of the forklifts 31 to a receiver 35 that is provided at a fixed location within the environment in which they are operated; receiver 35 may be provided on movable structures that move about the environment to receive the information transmitted thereon)** [Column 7, lines 24-37];

(c) said second communication means connecting said environmental condition measurement means with a server apparatus **(each of the forklifts 31 is further provided with a transmitter 33 or other communications system for transmitting the acquired data from the data acquisition device 32 to the remote analysis system 50 for analysis)** [Column 7, lines 5-8, 14-27, 38-39] and connecting said server apparatus with said at least one information display; and

(d) display information production means, provided at a server apparatus producing environmental conditions display information based on measured environmental condition values and on data stored in a database **(receiver 35 that is provided at a fixed location within the environment in which they are operated; receiver 35 may be provided on movable structures that move about the environment to receive the information transmitted thereon)** [Column 7, lines 24-37]; wherein

(e) said measured environmental conditions values are measured by said environmental condition measurement means, in conjunction with work progress of said plurality of work machines, and are transmitted from said environmental condition measurement means to said server apparatus through said second communication

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means (each of the forklifts 31 is further provided with a transmitter 33 or other communications system for transmitting the acquired data from the data acquisition device 32 to the remote analysis system 50 for analysis) [Column 7, lines 5-8, 14-27, 38-39]; and

(f) said server apparatus produces environmental condition display information (information relating to the operational characteristics of the asset 11 being tracked, or operating conditions of the forklift 31 that might be considered important in making effective management decisions regarding the operation of forklift 31), based on measured environmental conditions values {data provided by transmitter 33} and on data stored in said database (analysis controller database 78), said server apparatus transmits said environmental condition display information to said information display through said second communication means (receiver 35 that is provided at a fixed location within the environment in which they are operated; receiver 35 may be provided on movable structures that move about the environment to receive the information transmitted thereon; receiver 35 is connected to local controller 36, which is connected to remote analysis system 50 by conventional modem 37 or electronic communications network, such as the Internet), and said server apparatus causes said environmental condition display information to be displayed on said information display [Column 4, lines 34-44, Column 6, lines 52-63, Column 7, lines 24-37, 61-62, Column 8, lines 23-30].

Neither Melby et al. nor Gudat et al. explicitly teaches the measurement of environmental conditions including noise levels and toxic chemical concentrations. However, it has been admitted as prior art, as a result of improperly and/or untimely challenged Official Notice, that it is old and well known in the art to collect data regarding environmental conditions, and further that local, federal and international ordinances, regulations, and laws govern acceptable noise levels and toxic chemical concentration limits for areas in which work is performed. Therefore, it would have been obvious to one of ordinary skill in the art at the time of invention to modify the teachings of the Melby-Gudat combination to measure noise levels and toxic chemical concentrations, because doing so would allow the Melby-Gudat combination to perform work orders while simultaneously being in compliance with local, federal and international ordinances, regulations, and laws governing the noise, pollution, and toxic levels of the performed work, thereby avoiding costly fines and maintaining public safety, and minimizing the inconvenience to surrounding parties.

As per claim 55, Melby et al. teaches the work machine management system according to claim 33, wherein data on performance results for work performed by said plurality of work machines are stored in said database (**analysis controller database 78**) in said server apparatus for each of said plurality of work machines (**real-time and historical information; maintenance information performed {step 82}**), and when data requesting production of a work report relating to a specific work machine are transmitted from said at least one leader work machine to said server apparatus (**local**

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**controller 36 that is adapted to receive and store data from each of the receivers 35 and to periodically transmit gathered and stored information regarding the individual operating characteristics to the remote analysis system 50 for analysis) through said second communication means (modem 52 or similar communications device; conventional modem 37 or other communications device; electronic communications network, such as the internet 40), said server apparatus reads out work performance results data corresponding to said specific work machine from data recorded in said database, said server apparatus produces a work report indicating particulars of work performed in a certain time period by said specific work machine (management reports relating to the procurement and utilization of a plurality of the forklifts 31), and said server apparatus transmits said work report so produced to said at least one leader work machine by said second communication means, and said at least one leader work machine manages said plurality of work machines based on said work report (management report can advise the person or entity that owns or operates the asset 31; carrying out said work order to maintain the asset) [Column 7, lines 62-67, Column 8, lines 23-30, 48-52, Column 11, lines 42-44, Column 12, lines 18-19, 56-57; Claim 9].**

As per claim 56, Melby et al. teaches the work machine management system according to claim 55, wherein:

(a) a terminal apparatus for labor management (**handheld device 168**) is provided on the end where labor management is performed for persons on board said

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plurality of construction machines **(handheld device 168 is associated with specific maintenance personnel assigned to carry out the maintenance)** and

(b) wherein said at least one leader work machine is connected by said second communication means facilitating reciprocal communications therebetween **(handheld device 168 is in real-time two way communication with analysis controller database 78)** [Column 17, lines 25-27];

(c) wherein said at least one leader work machine transmits said work report to said terminal apparatus for labor management by aid communication means **(work order 166 is transmitted electronically to a handheld device 168 associated with specific maintenance personnel assigned to carry out the maintenance; work order 166 is sent electronically to appropriate maintenance personnel that contains all of the critical operating data required to effectively schedule and carry out the maintenance)** [Column 17, lines 5-9, 21-27]; and

(d) wherein said terminal apparatus for labor management performs labor management for those on board said plurality of construction machines based on said work report so transmitted **(information concerning anticipated parts and the nearest location from where they may be retrieved based on information contained within the fault code or retrieved from the knowledgebase; in response to a fault code, electronic checklist 154 is to be completed by asset operator on a regular basis in accordance with OSHA requirements)** [Column 17, lines 12-16].

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As per claim 57, Melby et al. teaches the work machine management system according to claim 33, wherein:

(a) said work machine information is work condition information indicating actual work conditions of a work machine **(operational characteristics of the particular asset 11 being tracked, such as the physical requirements or limitations of the asset (mast height, load capacity, types of tires, for example), the type of fuel used, and the period of time or usage between the performance of periodic maintenance; time duration of use (and non-use), distances traveled, the extent of fork usage, the nature of hydraulic system utilization, and the like)** [Column 4, lines 34-44, Column 6, lines 48-63];

(b) data on schedule of work to be performed by said plurality of work machines **(maintenance invoice)** are stored in a database in said server apparatus **(maintenance organization 86 both receives and provides information to database 78 )**, for each of said plurality of work machines [Column 11, line 61 – Column 12, line 4, Column 12, lines 34-36] ;

(c) wherein, when said work condition information is transmitted from said at least one leader work machine to said server apparatus through said second communication means, said server apparatus reads out said work schedule data from data stored in said database, compares said work schedule data and said work condition information, and, when there is a discrepancy, produces anomaly information indicating that an anomaly has occurred in corresponding work machine **(automatically generate maintenance and warranty reports in response to received information**



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**regarding assets 31; automatically generate and analyze management reports relating to the procurement and utilization of a plurality of the forklifts 31), and transmits said anomaly information (Once it is determined that maintenance of some type is required based on an analysis of the operational status of asset 31, a maintenance report is generated and made available electronically by the Internet) to said at least one leader work machine through said second communication means (fault code may be generated based on the actions of the asset operator)** [Column 6, lines 60-63, Column 15, lines 30-41, Column 16, lines 6-7, and lines 26-30]; and

(d) wherein said at least one leader work machine manages said plurality of work machines based on said transmitted anomaly information **(management report can advise the person or entity that owns or operates the asset 31; carrying out said work order to maintain the asset)** [Column 11, lines 42-44; Claim 9].

As per claim 58, Melby et al. teaches the work machine management system according to claim 33, wherein:

(a) said work machine information includes position information indicating an actual position of a work machine **(operational characteristics of the particular asset 11 being tracked, such as the physical requirements or limitations of the asset (mast height, load capacity, types of tires, for example), the type of fuel used, and the period of time or usage between the performance of periodic maintenance; time duration of use (and non-use), distances traveled, the extent of fork usage,**

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**the nature of hydraulic system utilization, and the like)** [Column 4, lines 34-44, Column 6, lines 48-63];

(b) operating position data reflecting operating positions at which said plurality of work machines operate are stored in the database **(real-time and historical information stored in analysis controller database 78; maintenance information performed {step 82})** [Column 12, lines 18-19, 56-57];

(c) wherein, when said position information is transmitted from said at least one leader work machine to said server apparatus through said second communication means, said server apparatus reads out said operating position data from said data stored in said database, compares said operating position data and said position information, and, when the position information deviates from the operating position data, produces anomaly information indicating that an anomaly has occurred in corresponding work machine **(fault code may be generated based on the actions of the asset operator {such as incorrect/unscheduled operating position} changes in operational parameters associated with asset 31 may result in the generation of a specific fault code)**, and transmits said anomaly information so produced to said at least one leader work machine by said second communication means **{data from data acquisition device 34 is transmitted to local controller 36 for transmission to database 78, and local controller 36 is connected to remote analysis system 50 via the Internet 40; thus database 78 has the ability to communicate with remote analysis system 50 via the Internet 40, as seen in Figure 3}** [Column 15, lines 17-20, 54-62, Column 16, lines 6-7, Column 17, lines 25-27, Figure 3]; and

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(d) wherein said at least one leader work machine manages said plurality of work machines based on said transmitted anomaly information (**management report can advise the person or entity that owns or operates the asset 31; carrying out said work order to maintain the asset**) [Column 11, lines 42-44; Claim 9].

As per claim 59, Melby et al. teaches the work machine management system according to claim 33, wherein:

(a) said work machine information includes attitude information indicating an actual attitude of a work machine (**operational characteristics of the particular asset 11 being tracked, such as the physical requirements or limitations of the asset (mast height, load capacity, types of tires, for example), the type of fuel used, and the period of time or usage between the performance of periodic maintenance; time duration of use (and non-use), distances traveled, the extent of fork usage, the nature of hydraulic system utilization, and the like**) [Column 4, lines 34-44, Column 6, lines 48-63];

(b) attitude limit values for said plurality of work machines are stored in the database in said server apparatus (**real-time and historical information stored in analysis controller database 78; maintenance information performed {step 82}**) in said server apparatus [Column 12, lines 18-19, 56-57];

(c) wherein when said attitude information is transmitted from said main at least one leader machine to said server apparatus through said second communication means, said server apparatus reads out said attitude limit values from said data stored

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in said database, compares said attitude limit values and said attitude information, and, when the attitude information exceeds the attitude limit values, produces anomaly information indicating that an anomaly has occurred in corresponding work machine **(fault code may be generated based on the actions of the asset operator {such as actual attitude exceeding attitude limit value}; changes in operational parameters associated with asset 31 may result in the generation of a specific fault code)**, and transmits said anomaly information to said main work machine through said second communication means [Column 15, lines 54-62, Column 16, lines 6-7]; and

(d) wherein said main work machine manages said plurality of work machines based on said transmitted anomaly information **(management report can advise the person or entity that owns or operates the asset 31; carrying out said work order to maintain the asset)** [Column 11, lines 42-44; Claim 9].

As per claim 60, Melby et al. teaches the work machine management system according to claims 57, wherein:

(a) an anomaly handling terminal apparatus **(handheld device 168)** is provided on the end where anomaly handling is performed for a construction machine where an anomaly has occurred, and said anomaly handling terminal apparatus and said server apparatus are connected by a third communication means facilitating reciprocal communications therebetween **(handheld device 168 is in real-time two way communication with analysis controller database 78; data from data acquisition device 34 is transmitted to local controller 36 for transmission to**

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**database 78, and local controller 36 is connected to remote analysis system 50 via the Internet 40; thus database 78 has the ability to communicate with remote analysis system 50 via the Internet 40, as seen in Figure 3)** [Column 15, lines 17-20, Column 17, lines 25-27, Figure 3];

(b) wherein said server apparatus, when anomaly information has been produced, transmits said anomaly information (**fault code**) to anomaly handling terminal apparatus through said third communication means (**work order 166 is transmitted electronically to a handheld device 168 associated with specific maintenance personnel assigned to carry out the maintenance; work order 166 is sent electronically to appropriate maintenance personnel that contains all of the critical operating data required to effectively schedule and carry out the maintenance**) [Column 17, lines 5-9, 21-27]; and

(c) wherein said anomaly handling terminal apparatus performs anomaly handling for said construction machine at which said anomaly occurred, based on said anomaly information (**management report can advise the person or entity that owns or operates the asset 31; carrying out said work order to maintain the asset**) [Column 11, lines 42-44; Claim 9].

As per claim 61, Melby et al. teaches the work machine management system according to claim 57, wherein:

(a) an anomaly handling terminal apparatus (**handheld device 168**) is provided on the end where anomaly handling is performed for a construction machine at

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which an anomaly has occurred, and wherein said anomaly handling terminal apparatus and said at least one leader work machine are corrected by a third communication means facilitating reciprocal communications therebetween (**handheld device 168 is in real-time two way communication with analysis controller database 78; data from data acquisition device 34 is transmitted to local controller 36 for transmission to database 78, and local controller 36 is connected to remote analysis system 50 via the Internet 40; thus database 78 has the ability to communicate with remote analysis system 50 via the Internet 40, as seen in Figure 3**) [Column 15, lines 17-20, Column 17, lines 25-27, Figure 3];

(b) wherein said at least one leader work machine transmits said anomaly information (**fault code**) to said anomaly handling terminal apparatus through said third communication means (**work order 166 is transmitted electronically to a handheld device 168 associated with specific maintenance personnel assigned to carry out the maintenance; work order 166 is sent electronically to appropriate maintenance personnel that contains all of the critical operating data required to effectively schedule and carry out the maintenance**) [Column 17, lines 5-9, 21-27]; and

(c) wherein said anomaly handling terminal apparatus performs anomaly handling for said construction machine at which said anomaly occurred, based on said anomaly information (**management report can advise the person or entity that owns or operates the asset 31; carrying out said work order to maintain the asset**) [Column 11, lines 42-44; Claim 9].

As per claim 62, Melby et al. teaches a management system for work machines that perform prescribed work by operation of a plurality of work machines, comprising:

(a) a plurality of work machines, said plurality of work machines being respectively including a first communication means facilitating reciprocal communications directly between said plurality of work machines [**see analysis of claim 33(a) above**];

(b) a server apparatus, wherein only at least one main working machine of said plurality of work machines is connected to the server apparatus by a second communication means facilitating reciprocal communications only between said server apparatus and said at least one leader work machine [**see analysis of claim 38(b) above**];

(c) work machine information detection means for detecting work machine information provided in each of said plurality of work machines [**see analysis of claim 33(c) above**];

(d) a database for storing data for managing said plurality of work machines, and management information production means for producing management information based on said work machine information and on said data stored in said database, provided at said server apparatus end [**see analysis of claim 33(d) above**];

(e) in conjunction with work progress of said plurality of work machines, said work machine information is detected by said work machine information detection means, and said work machine information so detected is transmitted to said at least

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one main work machine through said first communication means [**see analysis of claim 33(e) above**];

(f) said at least one main work machine transmits said transmitted work machine information to said server apparatus through said second communication means [**see analysis of claim 33(f) above**];

(g) said server apparatus produces said management information based on said transmitted work machine information and on said data stored in said database, and transmits said management information to said at least one leader work machine through said second communication means [**see analysis of claim 33(g) above**];

(h) said at least one leader work machine transmits work instructions to other work machines of said plurality of work machines through said first communication means, based on said transmitted management information [**see analysis of claim 33(h) above**];

(i) judgment means, provided in said at least one leader work machine for judging whether communications are possible or impossible by said second communication means between said at least one leader work machine and said server apparatus (**receiver 35 can send out a query signal on a predetermined basis to be received by the receiver 35 when the two units 32 and 35 are sufficiently close to communicate reliably with one another**) [Column 7, lines 38-53];

(j) wherein, when it is judged by said judgment means that communications by said second communications means are impossible, first latest management information received by said main work machine via said second communication means



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and second latest work machine information received by said at least one leader work machine via said first communication means are stored in said memory by said main work machine (**sensed operating conditions of the forklifts 31 are preferably stored in a memory of the data acquisition device 32 for subsequent communication to a remote analysis system**) until it is judged by said judgment means that communications by said second communication means have become possible **{when the data acquisition unit 32 contacts receiver 35, the receiver 35 can send a first signal back to the data acquisition unit 32 to begin transmitting the acquired data; at the completion of the data transfer, the receiver 35 can send a second signal back to the data acquisition unit 32 to acknowledge the receipt of the transmitted data; thus, when communications are possible, data is transmitted between work machines}** [Column 6, line 65 – Column 7, line 1, Column 7, lines 45-51].

As per claim 63, Melby et al. teaches a work machine management system for work machines that perform prescribed work by operation of a plurality of work machines, comprising:

(a) a processor **{data is transmitted via the Internet, a plurality of networked computers that each have a data processor}**;

(b) a plurality of work machines, said plurality of work machines respectively including a first communication means facilitating reciprocal communications directly between said plurality of work machines **[see analysis of claim 33(a) above]**;

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(c) only at least one leader work machine of said plurality of work machines being connected to said processor by a second communication means facilitating reciprocal communications only between said processor and said at least one leader work machine of said plurality of work machines [**see analysis of claim 38(b) above**];

(d) work machine information detection means for detecting work machine information, provided in each of said plurality of work machines [**see analysis of claim 33(c) above**];

(e) a database for storing managing data, for managing said plurality of work machines, and management information production software producing management information based on said managing data and said work machine information, operably connected to said processor [**see analysis of claim 33(d) above**];

(f) said processor, when said at least one leader work machine is determined, transmitting said managing data stored in said database and said management information production software to said at least one leader work machine through said second communication means [**see analysis of claim 33(g) above**];

(g) wherein, in conjunction with work progress of said plurality of work machines, said work machine information is detected by said work machine information detection means provided in said plurality of work machines, and said work machine information is transmitted to said at least one leader work machine or machines through said first communication means [**see analysis of claim 33(e) above**];

(h) wherein said at least one leader work machine produces said management information, based on work machine information transmitted from said

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plurality of work machines through said first communication means, and on managing data and management information production software transmitted from said management system through said second communication means [**see analysis of claim 33(g) above**], said at least one leader work machine manages said plurality of work machines by transmitting said management information to other work machines of said plurality of work machines in accordance with said first communication means, based on said management information, said at least one leader work machine transmits said managing data so updated to said management system, by said second communication means, every time a certain time period elapses (**receiver 35 is connected to local controller 36 and is programmed to periodically transmit the information stored therein to the remote analysis system 50 for analysis**; [Column 8, lines 23-25, further see analysis of claim 33(h) above]; and

(h) said processor updates content stored in said database using said managing data (**data in the form of new commands, program updates, instructions, and the like can be sent to the data acquisition unit 32 from the receiver 35**) [Column 7, lines 54-61].

As per claim 64, Melby et al. teaches a work machine management system for work machines that perform prescribed work by operation of a plurality of work machines, comprising:

(a) a processor **{data is transmitted via the Internet, a plurality of networked computers that each have a data processor}**;

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(b) a plurality of work machines, wherein said plurality of work machines respectively including a first communication means facilitating reciprocal communications directly between said plurality of work machines [**see analysis of claim 33(a) above**];

(c) only at least one leader work machine of said plurality of work machines being connected to the processor (**remote analysis system 50**) by a second communication means facilitating reciprocal communications only between said processor at said at least one leader work machine [**see analysis of claim 33(b) above**];

(d) work machine information detection means for detecting work machine information, provided in each of said plurality of work machines [**see analysis of claim 33(c) above**];

(e) a database storing managing data for managing said plurality of work machines, and management information production software producing management information based on said managing data and work machine information, provided at said processor [**see analysis of claim 33(d) above**];

(f) wherein when said at least one leader work machine is determined, said managing data (**operational characteristics of the particular asset 11 being tracked, such as the physical requirements or limitations of the asset (mast height, load capacity, types of tires, for example), the type of fuel used, and the period of time or usage between the performance of periodic maintenance; time duration of use (and non-use), distances traveled, the extent of fork usage, the**

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**nature of hydraulic system utilization, and the like)** stored in said database **(analysis controller database 78)** and said management information production software are written to said at least one leader work machine **(data acquisition device 32 is provided on each of the forklifts 31 for sensing and storing one or more characteristics of the associated forklift)** [Column 4, lines 34-44, Column 6, lines 48-50, 52-63];

(g) wherein, in conjunction with work progress of said plurality of work machines, said work machine information is detected by said work machine information detection means provided in said plurality of work machines, and said work machine information so detected is transmitted to said at least one leader work machine through said first communication means **[see analysis of claim 33(e) above]**;

(h) wherein said at least one main work machine produces said management information based on work machine information transmitted from said plurality of work machines to said at least one leader work machine in accordance with said first communication means, and on said managing data and management information production software **[see analysis of claim 33(g) above]**, said at least one leader work machine manages said plurality of work machines by transmitting said management information to other work machines of said plurality of work machines in accordance with said first communication means, based on said management information so produced **[see analysis of claim 33(h) above]**, and said at least one leader work machine updates said managing data **(receiver 35 is connected to local controller**

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**36 and is programmed to periodically transmit the information stored therein to the remote analysis system 50 for analysis;** [Column 8, lines 23-25]; and

(i) content stored in database in said processor is updated by the at least one leader work machine writing said updated managing data in accordance with said second communication means to said processor **(data in the form of new commands, program updates, instructions, and the like can be sent to the data acquisition unit 32 from the receiver 35)** [Column 7, lines 54-61].

### ***Conclusion***

5. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Devier et al. (US Patent #6,037,901) teaches a system and method for communicating information for fleets of earthworking machines.

Gudat et al. (US Patent #5,631,658) teaches a method and apparatus for operating geography-altering machinery relative to a work site.

Arakawa et al. (US Patent #6,856,879) teaches a work machine management device.

Kalafut et al. (US Patent #6,453,227) teaches a method and apparatus for providing a display of a work machine at a work site.

6. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Peter Choi whose telephone number is (571) 272 6971. The examiner can normally be reached on M-F 8-5.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Tariq Hafiz can be reached on (571) 272-6729. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

PC

April 29, 2007

  
**TARIQ R. HAFIZ**  
SUPERVISORY PATENT EXAMINER  
TECHNOLOGY CENTER 3600